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ascendent frontal convolution appears on the surface better defined in its outlines, and more independent of adjacent convolutions. There are four examples of supernumerary convolutions, but only one offers the characteristic anomaly. The author gives a carefully arranged and detailed table, showing the age, stature, weight, crime, along with the cerebral anatomical peculiarities.

It seems to us that while there is not exact agreement between Tenchini and Benedikt, the results of the former are not a strong argument against a cerebral criminal type, since comparatively so few brains of criminals have been studied.

*Anatomische Studien an Verbrecher-Gehirnen, für Anthropologen, Mediciner, Juristen und Psychologen.* MORIZ BENEDIKT. Wien, 1879. pp. 151.

That man thinks, feels, wills and acts according to the anatomical foundation and physiological development of his brain was a doctrine of faith among the ancients. Owing to the meagre development of anatomy and physiology, this doctrine remained latent for many generations, until the founding of cranioscopy by Blumenbach, and the impetus which Gaul brought to the study of the brain. In spite of all contradictions in detail, the ancient faith doctrine has been more and more strengthened by the results of modern investigations. It is desirable to inquire if the study of criminals' brains will not strengthen still more this faith.

The want of power to resist criminal acts, and the want of feeling the wrong, together with having a clear knowledge of it at the same time, are the two main psychological characteristics of criminals. This defect in moral feeling and willing can be concealed by a superior psychical organization and ability, latent or through complication with insanity. The following facts show defects in the brains of criminals: a defective development of bridges, and thereby an excessive development of fissures; these are found throughout the whole brain. A priori, this would be expected, because otherwise the tendency to defective acts would have been compensated for by other parts of the brain. Criminals are not analogous to monomaniacs, but their actions follow from their whole psychical organization, and in their special manifestation are the product of social conditions. The details of the following results will probably be found to unite with those in epileptics, insane, and in members of encephalo-pathological families. The physiological-psychological value of single facts is not known.

That an atypical and defective brain can function normally, is out of the question. What we do not know is, why such a brain functions this way and not that; and why, under certain psychological conditions, it functions just in this way. From the detailed examination of 19 criminals' brains, two things are established: 1. A type of the confluence of fissures. 2. That those 19 brains belong to this type.

The chief characteristic of this type is, that if we regard the fissures as rivers, floating bodies can pass into almost all the other fissures; also bridges are wanting, which means the lack of important brain substance. The three important fissures of the outer surface, that is, the central fissure, the third frontal fissure and a portion of the interparietal fissure, show a great tendency to unite with the Sylvian fissure, so that we have not only an anterior and posterior rising branch, but also three other branches. Since the third frontal and interparietal fissures tend further to lengthen upwards towards the superior median border, there frequently arise three central parallel fissures, of which the third frontal one appears pre-central, and the interparietal fissure as post or retrocentral. The last formation does not arise through lengthening, but by a flowing together, and partly of fissures that are scarcely seen in the normal

brain. In the frontal region, the one or the other frontal fissure is united with this central fissure. In some of the brains the inferior fissure becomes long and deep; this cuts often into the superior part of the anterior central convolution, and participates in the formation of the precentral fissure. Thus we have four frontal convolutions, as is the case in the beasts of prey (cat, fox). It is true that a large number of fissures is a sign of development, where a new typical fissure appears; but around fissures where no new development takes place, and especially where the union of the different typical fissures takes place, a large number of fissures means a defect, through the failure of bridges.

The second type was in embryo. Rüdinger has shown that brachy and dolicocephalic brains manifested their characteristics in the foetal life. It would be important if comparative brain anatomy could show the prevalence of this second type in the lower races. It may be said that there is no fissure idea in the architecture of the animal's brain that may not be seen in the human brain. Since five races are represented in the brains examined, and the deviations from the normal brain are so similar in each, we may conclude that the brains of criminals show variations from the normal type, and the criminals are an anthropological variety or species, at least of the civilized races. This investigation is on the a priori assumption that the criminal is abnormal, but the abnormality is not a disease but a predisposition to it. After a somewhat detailed criticism of Broca's work, the author comes to the question whether from the atypical relations of the cranium one can make any conclusion as to the atypical form of the brain. In the normal brain and cranium the bregma is 4.5 cm. in front of the fissure of Rolando, and the intersection of the sagittal and lambda sutures in the highest point of the perpendicular fissure. The question is, does this relation exist between the atypical cranium and brain? As yet there is no answer. Yet a parallelism between cranium and brain can be assumed, but not a definite correspondence. The results of this investigation, the author thinks, may call forth objections from the side of ethics. He says: "We will not appeal to the facts of empirical criminal psychology, nor to the premises of the psychology of nature, which support our position. Kant's antinomies place freedom and necessity as justified, and at the same time contradictory; these antinomies, however, are the end and purpose of knowledge, and not its premises. One can hold that psychical freedom is only the expression of the psychical realm, but that all psychical antecedents are the expression of certain natural laws, and so one can swear allegiance to an absolute psychical freedom. Kant freed humanity from metaphysical intolerance, but it did not enter into its inheritance; but this generation is entering into a metaphysical neutrality as regards the question of free will."

In closing, the author emphasizes the fact that to correct the criminal and protect society, the criminal must be studied scientifically; hence there should be in universities and higher courts of justice and in prisons, places for instruction and investigation.

*Ueber die Beziehungen der Schädellehre zur Physiologie, Psychiatrie und Ethnologie.* DR. RIEGER. Würzburg, 1882.

In describing the different points of view in craniology, the writer says, that ethnology is concerned strictly with morphological craniology, enquiring how far cranial forms can serve as race characteristics. Psychiatry has more complicated questions as to the relation between cranium and brain, and between cranial abnormalities and psychical conditions. Here physiological as well as morphological questions must be touched upon. Ethnology assigns too much importance to the cranium and psychiatry too little. Bordier finds that none of his 35 craniums of